



**Written Testimony of the Honorable James C. Greenwood
President and CEO, Biotechnology Innovation Organization
U.S. House of Representatives
Committee on Agriculture
Subcommittee on Commodity Exchanges, Energy, and Credit
*The Next Farm Bill: Examining Rural Development & Energy Programs***

March 9, 2017

Introduction

The Biotechnology Innovation Organization (BIO) is the world's largest trade association representing biotechnology companies, academic institutions, state biotechnology centers and related organizations across the United States and in more than 30 other nations. BIO members are involved in the research and development of innovative healthcare, agricultural, industrial and environmental biotechnology products. Our members are working every day to solve the greatest challenges facing society – whether it is finding a cure for cancer, protecting the public against bio-terror threats, feeding hungry people nutritious food, or generating renewable fuels, renewable chemicals and biobased products. We support public policies, including government funding for key agencies and programs that unleash our members' scientific innovation potential and grow the bioeconomy. BIO also is one of the founding members of the Agriculture Energy (Ag Energy) Coalition, a coalition of trade groups, companies, and organizations representing thousands of farmers and businesses across the United States who are developing an "all-of-the-above" approach to renewable energy, energy efficiency, and farm and forest resources.

Within its broad membership, BIO's member companies are developing new agricultural and low-carbon feedstocks, industrial enzymes, and biological catalysts for the conversion of biomass into advanced biofuels, alternative jet fuels, renewable chemicals, and biobased products. Utilizing the power of industrial biotechnology, companies across the country are creating a robust biobased economy. Biobased production encompasses a complex value chain, from agriculture through the manufacture of consumer goods, that provides an alternative to the petroleum-based value chain and that brings environmental, economic and other benefits. The biobased economy can generate new markets for agricultural producers, boost innovation in domestic manufacturing, and stimulate sustainable economic growth. These companies are developing plant biotechnologies that improve crop insect resistance, enhance crop herbicide tolerance, and facilitate the use of more environmentally sustainable farming practices. In animal agriculture, biotechnology is used to genetically engineer animals to improve their suitability for pharmaceutical, agricultural, and industrial applications.

The biobased economy and industrial biotechnology already contribute to millions of jobs and hundreds of millions of dollars in annual economic activity. And we are poised for accelerated growth in the 21st century. The Farm Bill energy title can unleash this potential growth, creating tens of thousands of more jobs in rural America and promoting billions of dollars of additional economic activity.

Revitalizing Rural Economies

Much has changed since Congress passed the current Farm Bill, the *Agricultural Act of 2014*.¹ As the *Wall Street Journal* noted last month, American farmers and rural communities are hurting economically. A multiyear slump in prices for corn, wheat and other farm commodities brought on by a world-wide glut of grain is pushing many farmers into debt. Net farm income dropped 15 percent to about \$68 billion last year, the lowest since 2009,² according to the Agriculture Department. It is expected drop another 9 percent in 2017,³ extending the steepest slide since the Great Depression into a fourth year. As incomes drop, the number of farms continues to decline; there are now fewer than 2 million farms in America.

Federal lawmakers have worked over many years to craft policies in the Farm Bill that minimize farm household income fluctuations caused by volatility associated with agricultural production.⁴ As members of the Committee begin their work on the development of the next Farm Bill, they should keep in mind that policies supporting and growing the 21st century biobased economy can help reverse the economic trends farmers and rural communities are currently facing. Chief among these policies is the Farm Bill energy title, which creates high-value careers and new income streams for American farmers, accelerates the commercialization of new technologies and products derived from agricultural products, and supports construction of biorefinery manufacturing facilities in rural communities. Conventional and advanced biofuels, renewable chemicals, and biobased products made with industrial biotechnology are helping diversify demand for crops and crop residues. Just as modern oil refineries take a crude oil feedstock and produce many value-added products, biorefineries will take renewable feedstocks and make multiple products in the not-too-distant future.

The Value of the Biobased Economy

During the three years of deliberations that led to the 2014 Farm Bill, BIO and the Ag Energy Coalition advocated for a robust energy title with mandatory funding to incentivize development and growth of the biobased economy. Within Title IX of the last Farm Bill, the energy title received \$881 million in mandatory funds in 2014, representing less than 1 percent of the overall Farm Bill budget. This small amount of funding yields big results for the overall economy. According to the U.S. Department of Agriculture (USDA), the number of jobs contributed to the U.S. economy by the biobased products industry in 2014 was 4.2 million, up from 4.0 million in 2013. In addition to the direct jobs created by the industry, the biobased economy generates a jobs multiplier of 2.76, meaning for every 1,000 biobased products jobs, 1,760 more jobs are supported in the United States.⁵ This industry contributed \$393 billion to the U.S. economy in 2014, up from \$369 billion in 2013. This broad economic impact comes from biorefineries that are commercializing a range of technology solutions to produce commodity and specialty renewable chemicals as well as

¹ H.R. 2642, 113th Cong., Pub.L. 113-79 <https://www.congress.gov/113/plaws/publ79/PLAW-113publ79.pdf> (2014) (enacted).

² Dow Jones & Company, Inc. All Rights Reserved. (Feb. 10, 2017). Trade Punishment for Trump Voters. The Wall Street Journal. <https://www.wsj.com/articles/trade-punishment-for-trump-voters-1486686758>

³ Newman, J., & McGroarty, P. (Feb. 8, 2017). The Next American Farm Bust Is Upon Us. The Wall Street Journal. <https://www.wsj.com/articles/the-next-american-farm-bust-is-upon-us-1486572488>

⁴ Good, K. (Feb. 28, 2017). USDA Report Examines Farm Household Income Volatility. Farm Policy News. <https://farmpolicynews.illinois.edu/2017/02/usda-report-examines-farm-household-income-volatility/>

⁵ Golden, J., Handfield, R., Daystar, J., & McConnell, E. (Oct. 2016). USDA: An Economic Impact Analysis of the U.S. Biobased Product Industry. <https://www.biopreferred.gov/BPRResources/files/BiobasedProductsEconomicAnalysis2016.pdf>

advanced biofuels. Industrial biotechnology companies are pursuing renewable chemicals and biobased materials because they can be commercialized at smaller scale and they promise environmental benefits, stable costs, and novel properties in comparison to fossil fuel-derived chemicals. Competition to produce platform renewable chemicals provides manufacturers assurance of a steadily available, high-quality supply of renewable chemicals for consumer product applications.

These facilities are being built in rural communities near biomass resources. The demand for biomass helps agriculture producers by giving them a value-added product they can grow to offset low commodity prices. The demand for employees to build and operate these biorefineries helps to revitalize rural communities.

Development of these biorefineries can bring long-term economic development to rural communities through the predicted rapid expansion of renewable chemical production in the near future. McKinsey & Co. estimates that there were \$252 billion in global sales of biobased products in 2012, with biofuels and plant extracts comprising more than half. Sales of renewable chemicals represented 9 percent of the \$2.820 billion in worldwide chemical sales in 2012. By 2020, McKinsey expects biobased products to make up 11 percent of the \$3.401 billion global chemical market. Sales of biobased products would reach \$375 to \$441 billion by 2020, with a compound annual growth rate of 8 percent over the preceding decade.⁶

Gains in productivity associated with biotech crops also help grow the American agricultural trade surplus because so many biotech crop harvests are dedicated to foreign markets. In fiscal year 2015, U.S. agricultural exports totaled more than \$143 billion, contributing to a \$27.5 billion agricultural trade surplus. This is in part due to biotechnology, which has contributed to a strong and steady growth in the U.S. agricultural export market, particularly for corn and soybeans. It is noteworthy that, according to the White House National Bioeconomy Blueprint, published in 2012, U.S. revenues from biotech crops totaled more than \$75 billion. The investments by companies in research, development and commercialization of these crops have generated good jobs all across our country.

In addition to boosting farmer incomes, creating jobs, and revitalizing U.S. manufacturing, the biobased economy is lessening our dependence on foreign sources of petroleum. While the U.S. has benefited in recent years from increased production of domestic oil and gas, we are still unnecessarily impacted by the global price of oil and those who control it. One need look no further than OPEC's conscious decision two years ago to try to squeeze U.S. producers out of the market, followed by OPEC's cut in production last fall. OPEC's actions caused a 10 percent increase in oil prices in one day, and prices continued to climb to an 18-month high within a month. Biobased products and renewable fuels are helping to offset the impact OPEC has on our energy prices. In 2014 biobased products replaced about 6.8 million barrels of oil, while in 2015, renewable fuels displaced an amount of gasoline equivalent to 527 million barrels of crude oil. That's roughly the volume of oil imported annually from Saudi Arabia and Kuwait combined.⁷

Whether the growth and benefits from this industry occur in the United States will depend on supportive policies to help grow the 21st century biobased economy. The 2014 Farm Bill energy title programs spurred the development of this industry. To ensure the biobased

⁶Biotechnology Innovation Organization (BIO). Advancing the Biobased Economy: Renewable Chemical Biorefinery Commercialization, Progress, and Market Opportunities, 2016 and Beyond.

https://www.bio.org/sites/default/files/BIO_Advancing_the_Biobased_Economy_2016.pdf

⁷ Urbanchuk, J (Feb. 2016). ABF Economics: Contribution of the Ethanol Industry to the Economy of the United States in 2015. <http://ethanolrfa.org/wp-content/uploads/2016/02/Ethanol-Economic-Impact-for-2015.pdf>

industry continues to expand in the United States, Congress must improve upon the existing Title IX programs and provide mandatory funding. This will help innovative U.S. companies continue to commercialize advanced biotech processes. Putting homegrown technologies to work converting domestic crops and residues to value-added products can create high-quality rural jobs, spur economic growth, and improve environmental health.

What follows are the existing programs contained within Title IX of the 2014 Farm Bill, how the programs work, the jobs, facilities, and products these programs have helped develop, and how BIO believes these programs can be improved in the next Farm Bill.

Farm Bill Energy Title Programs

- Section 9002 Biobased Markets Program, known as the BioPreferred® Program
- Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Assistance Program (BAP)
- Section 9005 Bioenergy Program for Advanced Biofuels
- Section 9007 Rural Energy for America Program (REAP)
- Section 9008 Biomass Research and Development (BRDI)
- Section 9010 Biomass Crop Assistance Program (BCAP)

Section 9002, the Biobased Market Program, or the BioPreferred® Program

Managed by USDA, the goal of the BioPreferred program is to increase the purchase and use of biobased products from agricultural feedstocks. The BioPreferred® Program was created by the 2002 Farm Bill and reauthorized and expanded as part of the Agricultural Act of 2014 (the 2014 Farm Bill). The program's purpose is to spur economic development, create new jobs and provide new markets for farm commodities. The increased development, purchase, and use of biobased products reduces our nation's reliance on petroleum, increases the use of renewable agricultural resources, and mitigates adverse environmental and health impacts.⁸

BioPreferred® Program is transforming the marketplace for biobased products through two initiatives: purchasing requirements for Federal agencies and their contractors; and voluntary product certification and labeling. Federal law, the Federal Acquisition Regulation, and Presidential Executive Orders direct all federal agencies and their contractors to purchase biobased products in categories identified by USDA through the BioPreferred® Program. To date, over 14,000 biobased products in 97 product categories (e.g. cleaners, carpet, lubricants, paints) listed in the BioPreferred® Catalog qualify for mandatory federal purchasing. In Fiscal Year 2017, Federal agencies have committed to include biobased product purchasing requirements in 84,433 contracts totaling \$453,150,168.

The BioPreferred® Program also drives growth of the bioeconomy by helping drive consumer recognition of biobased products. USDA is making it easier for consumers to identify biobased products with the USDA Certified Biobased Product label. There are currently more than 2,700 voluntarily labeled products: 1,700 of them are consumer goods, 400 are renewable chemicals, and 600 are industrial products.

Brand owners such as Procter and Gamble (P&G) on their Tide bottle; General Mills on their cereal boxes; Unilever on their detergents; and The Coca-Cola Company on their PlantBottle® packaging, all use USDA's label to show consumers the biobased content in their products. Eventually, P&G intends to use only recycled or renewable materials to make

⁸USDA. What Is Biopreferred? <https://www.biopreferred.gov/BioPreferred/faces/pages/AboutBioPreferred.xhtml>

and package its consumer products. Wal-Mart has set goals to sell only products that use renewable energy and produce zero wastes. The BioPreferred® Program helps create this market pull for renewable chemicals and biobased products and creates a uniform process for companies interested in these technologies.

Recommendations for the Next Farm Bill

USDA should establish within the BioPreferred® Program's voluntary labeling and procurement system a campaign to increase public awareness and acceptance of renewable chemicals and biobased products. The BioPreferred program also should develop an annual report both auditing and tracking USDA's voluntary Certified Renewable Chemicals and Biobased Product labeling program and showing procurement and sales of biobased products by federal agencies and their contractor's.

Additionally, USDA could work with United States Department of Commerce in developing North American Industry Classification System (NAICS) codes that identify renewable chemical and biobased product manufacturers. USDA should explore combining its certified renewable chemicals and biobased products labeling program with the Environmental Protection Agency's Safer Choice label, providing consumers the ability to identify products that are both certified biobased and safer for human health and the environment.

Finally, we ask Congress to consider increasing mandatory funding for this program to \$10 million annually.

Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Assistance Program

The Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (BAP), also known as the Section 9003 Program, provides loan guarantees to assist in the construction of advanced biofuels biorefineries. Consistent with BIO's past advocacy, it was expanded to include renewable chemicals and biobased products manufacturing facilities in the 2014 Farm Bill.⁹

This loan guarantee program enables manufacturers to access capital for large-scale projects in rural communities. Without the loan guarantee program, new innovative companies might never be able to pool sufficient capital to commence development of a project in a rural community with a small population. Section 9003 has enabled companies to put steel in the ground for first-of-a-kind biorefineries. These biorefineries are proven job and economic growth drivers for rural communities.

Sapphire – Columbus, New Mexico

In 2011, under this program, USDA provided Sapphire Energy a \$54.5 million loan guarantee to build a refined algal oil commercial facility. Sapphire's "Green Crude Farm" in Columbus, NM, is an example of how USDA funding and partnerships with the private sector are helping to support the development of biorefineries. About a four-hour drive south of Albuquerque, roughly 1,700 Columbus residents live at the southern edge of New Mexico and the United States. In the desert scrub outside of Columbus the plant opened in May 2012 to produce renewable algal oil. According to the company, more than 600 jobs were created during the first phase of construction at the facility and during operations the plant

⁹ USDA. Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program. https://www.rd.usda.gov/files/fact-sheet/RD-FactSheet-RBS_Biorefinery.pdf

employs approximately 30 people.¹⁰ After Sapphire received additional equity from private investors, it repaid the remaining balance on its USDA-backed loan in 2013. The plant is current being brought fully online to produce algae for human and animal nutritional products. It is a measured and effective approach to becoming a permanent form of nutritional oils and protein for the world.¹¹

Fulcrum Sierra Biofuels – Storey County, Nevada

Section 9003 is supporting development of the exciting field of alternative jet fuels. In 2014, USDA closed on a loan guarantee to Fulcrum Sierra Biofuels, LLC, to build a biorefinery to produce jet fuel from municipal solid waste in Storey County, Nevada, approximately 20 miles east of Reno. Fulcrum will produce synthesis gas from 147,000 tons of municipal solid waste and catalytically convert it to synthetic paraffinic kerosene/jet fuel through a proprietary technology. The plant will be the first of what the company expects to be several bio jet fuel plants throughout the country. At the same time as USDA made its loan guarantee, Cathay Pacific Airways announced investment in Fulcrum Bioenergy and negotiated a long-term supply agreement for 375 million gallons of sustainable aviation fuel over 10 years. This would represent about 2 percent of the airline's annual fuel consumption.¹²

Biosynthetic Technologies – Texas

With Section 9003 expanded in 2014 to make renewable chemicals and biobased products manufacturing facilities eligible to participate in the program, Irvine, California-based, Biosynthetic Technologies, LLC, received conditional approval from USDA for its loan guarantee application. Biosynthetic Technologies is working with a rural lender to finance the construction of a full-scale commercial manufacturing plant in Houston that will produce 20 million gallons a year of its oil-based ingredient for high-performance motor oils, industrial lubricant products, and cosmetic ingredients. These biobased oils have higher viscosity, thermal stability, and flash point than traditional petroleum motor oils as well as existing synthetics. This new project will create manufacturing jobs in the United States, strengthen the agricultural sector, and help create environmentally friendlier products that perform better.¹³

Recommendations for the Next Farm Bill

The 2014 Farm Bill extended loan guarantee eligibility to renewable chemicals and biobased products makers. However, due to a drafting error when reconciling the differences between the House and Senate versions of the 2014 Farm Bill, language was inadvertently deleted that would have allowed stand-alone renewable chemical facilities to fully participate in the program. Under USDA's current regulations, all biorefinery projects must produce an advanced biofuel, even if the main purpose of the project is to create renewable chemicals. As a result, a number of renewable chemical producers are ineligible because it is too costly

¹⁰ Bio-Based World News. (Aug. 10, 2016). \$250m USDA funding pool to help bio-based chemicals and products seeks applications <https://www.biobasedworldnews.com/250m-usda-funding-pool-to-help-bio-based-chemicals-and-products-seeks-applications>

¹¹ Sapphire Energy, Inc. Algae Farm. (2015). <http://www.sapphireenergy.com/locations/green-crude-farm.html>

¹² USDA. Fletcher, J. (Press Release No. 0195.14). USDA Announces Loan Guarantee to Help Innovative Company Turn Waste Into Renewable Jet Fuel. <https://www.usda.gov/wps/portal/usda/usdamediafb?contentid=2014/09/0195.xml>

¹³ Business Wire. (Feb. 01, 2016). USDA Reserves Over \$100 Million in Loan Guarantee Funding for Biosynthetic Technologies. <http://www.businesswire.com/news/home/20160201005258/en/USDA-Reserves-100-Million-Loan-Guarantee-Funding>

or impractical for them to retrofit their processes to produce a biofuel, in addition to a renewable chemical.

BIO urges the Committee to amend the language in Section 9003 to ensure stand-alone renewable chemical facilities are eligible in the next Farm Bill. BIO also requests the Committee work with USDA to ensure timely implementation of the new rules that will come as a result of the next Farm Bill to ensure USDA makes funding available in a timely manner. Maintaining mandatory funding for this program is crucial for its success in enabling companies to secure the financing they need to commercialize biorefinery projects.

Section 9005 Bioenergy Program for Advanced Biofuels

This program encourages production of advanced biofuels, other than corn starch ethanol. The policy goal is to create long-term, sustained increases in advanced biofuels production. Under the last Farm Bill, awards totaling \$8.8 million were made through Rural Development to biofuels producers, based on the amount of advanced biofuels produced from renewable biomass. Feedstocks incentivized by this program include crop residue, food and yard waste, vegetable oil and animal fat. The program has promoted the development of wood pellets, biodiesel, advanced and cellulosic ethanol, and biogas.¹⁴

The return on investment (ROI) for new technologies, including advanced biofuels, are important to driving investor interest. Many advanced biofuels are still utilizing brand new technologies and plants, so there is much to learn and improve. Initial investment costs for these technologies and plants will improve with time, practice, learning, and ultimately additional plants. Efficiencies across the value chain – including biomass harvest and storage, engineering improvements, construction learnings and regulatory approvals – must be made in order to improve the economic outlook and certainty for the ROI. Section 9005 funding helps investors in these new technologies with the requisite ROI needed to proceed with constructing a new plant or expanding capacity at an existing facility. Without Section 9005 mandatory funding, companies working on advanced biofuel technologies have one less tool to support innovation and commercialization of the cleanest fuels in the world. Current USDA and DOE funding programs help advanced biofuels succeed; the industry cannot afford to be without one of these programs.

Recommendations for the Next Farm Bill

It is critical the Committee maintain robust mandatory funding for Section 9005 to help grow and expand the advanced biofuels industry nationwide.

Section 9007 Rural Energy for America Program (REAP)

REAP has been a remarkably popular, successful, and constructive program that supports every state and region and renewable energy and energy efficiency technology. REAP provides benefits to the full agricultural value chain, from producers to coops, to biotechnology and clean technology companies operating across rural America. Nearly 13,000 projects in all 50 states have received awards since the 2008 Farm Bill, leveraging more than \$3 billion in private investment. REAP is one of agriculture's best ways of improving the nation's energy infrastructure and resiliency.

The program has been instrumental in helping deploy biogas systems throughout the rural economy allowing agricultural producers, through the use of digesters, to make products

¹⁴ USDA. Advanced Biofuel Payment Program. https://www.rd.usda.gov/files/RD_AdvBiofuelsChart_2016.pdf

from waste streams – manure and crop residues – that would otherwise be viewed as an environmental challenge. Farmers can now take these wastes streams and make on-farm energy, nutrient-rich soil amendments, fertilizers, a renewable replacement for natural gas, and even feedstocks for renewable chemicals and bioplastics. The sale of all these products helps protect the agricultural producer from uneven commodity prices.

REAP improves profit margins for farmers, ranchers, and rural small businesses by cutting energy costs with modern energy efficiency and renewable energy technologies. With REAP, businesses become more efficient, resilient to energy market changes, and more energy independent. Growing economic opportunities with proven energy technologies excites rural citizens and communities and helps keep younger generations in rural areas and in farming.

Recommendations for the Next Farm Bill

The program has been oversubscribed year after year; it should be expanded both in terms of funding and scope in the next Farm Bill. For example, REAP should be modified to make clear that varying biomaterials projects are fully eligible for funding. In addition, BIO and the Ag Energy Coalition would like to see improvements so that underserved technologies like small-scale wind generation and biogas are better served.

Section 9008 Biomass Research and Development (BRDI)

The Biomass Research and Development Initiative (BRDI)¹⁵ seeks to foster significant commercial production of biofuels, biobased energy innovations, development of biobased feedstocks, and biobased products and processes, including cost-competitive cellulosic ethanol. To this end the program provides competitive funding in the form of grants, contracts, and financial assistance for research, development, and demonstration of technologies and processes. Eligibility is limited to institutions of higher learning, national laboratories, federal or state research agencies, private-sector entities, and nonprofit organizations.¹⁶

This program has afforded researchers across the country opportunities to explore new techniques and feedstocks that will enable the biotech industry to build facilities nationwide and create a true biobased economy. Whether it is examining on-farm biomass processing in Kentucky or co-treatment for low-cost fermentation of cellulosic biomass in New Hampshire, this program is key to unlocking the technical challenges of deploying these technologies nationwide.¹⁷

Recommendations for the Next Farm Bill

It is critical the Committee maintain robust funding for BRDI. Cuts in the appropriations process have led to smaller grants, limiting the diversity of projects.

Section 9010 Biomass Crop Assistance Program (BCAP)

The Biomass Crop Assistance Program (BCAP) provides financial assistance to owners and operators of agricultural and non-industrial private forest land who wish to establish,

¹⁵ USDA. (Feb. 26, 2015). Biomass Research and Development Initiative (BRDI) <https://nifa.usda.gov/funding-opportunity/biomass-research-and-development-initiative-brdi>

¹⁶ USDA CRS Report <https://www.everycrsreport.com/reports/R43416.html#fn31>

¹⁷ USDA NIFA Current Research Information System. [http://cris.nifa.usda.gov/cgi-bin/starfinder/0?path=fastlink1.txt&id=anon&pass=&search=\(qc=BRDI%20OR%20GC=RDFD\)&format=WEBTITLE SG](http://cris.nifa.usda.gov/cgi-bin/starfinder/0?path=fastlink1.txt&id=anon&pass=&search=(qc=BRDI%20OR%20GC=RDFD)&format=WEBTITLE SG)

produce, and deliver biomass feedstocks.¹⁸ BCAP provides two categories of assistance: matching payments and establishment and annual payments.

In fashioning the 2014 Farm Bill, Congress made a number of changes to BCAP. Standing out among the changes was a cap on the program's mandatory authorization level. The 2014 Farm Bill imposed for the first time a \$25 million cap per year in mandatory funding for FY2014 through FY2018.

This cap was due at least in part to concerns that arose in the early years after BCAP was authorized -- for example, that it could heighten competition over eligible woody biomass, thus raising the price of that material to the detriment of traditional users, such as nurseries and others, and that the by-product of paper production, "black liquor," could qualify for Collection, Harvest, Storage, and Transportation (CHST) matching payments. Such concerns have been addressed or have become less acute.¹⁹

Despite the initial challenges of developing and implementing BCAP, this remains a crucial program for developing the feedstocks necessary for the biobased economy. The program's regionally appropriate biomass feedstocks are key to the development of sustainable systems for biofuels, renewable chemicals, and biobased products.

BCAP has incentivized nearly 1,000 growers and landowners farming nearly 49,000 acres to establish and produce dedicated, non-food energy crops for delivery to energy conversion facilities.²⁰ In 2014 and 2015, USDA approved 209 contracts for matching payments of \$15.8 million toward the collection or harvest of approximately 300,000 dry tons of forest residues from National Forest Service and Bureau of Land Management public lands. Forest residues are removed for the reduction or containment of disease or insect infestation and reduction of fire threat.²¹

In 2016, \$1 million was allocated toward the sign-up of 1,000 acres of miscanthus in project area 5 in Ohio and Pennsylvania²² and of shrub willow for project area 10 in New York.^{23,24}

In the miscanthus project, BCAP was critical in helping Aloterra establish 5,000 acres of a perennial grass on cropland that was sitting idle and underutilized in Northeast Ohio and Northwest Pennsylvania. BCAP enabled local farmers to wait 3 years before earning income from a harvest of this new perennial grass. Aloterra then leveraged the program to bring an additional \$20 million in private funds to build two manufacturing facilities in Ashtabula County, Ohio. This region has been heavily impacted by the opioid epidemic and manufacturing job losses and badly needs good paying manufacturing jobs. Because of BCAP, Aloterra has now created over 60 full-time jobs in the region and brought a new cash crop to poor farmland that was idle. BCAP drives a very powerful economic combination of farming and rural manufacturing. Aloterra is now operating the only facility in North America

¹⁸ USDA BCAP <https://www.fsa.usda.gov/programs-and-services/energy-programs/BCAP/>

¹⁹ CRS R41296 Biomass Crop Assistance Program (BCAP): Status and Issues Jan. 12, 2015. <https://www.everycrsreport.com/reports/R41296.html>

²⁰ Biomass Crop Assistance Program (BCAP) Qualified Biomass Conversion Facilities (BCF's) FY 2017. <https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Energy/BCAP%20Facility%20Listing%20FY2017.pdf>

²¹ USDA Resumes Incentives to Grow the Bioeconomy and Improve Forest Health. https://www.fsa.usda.gov/news-room/news-releases/2016/nr_20161110_rel_185

²² Biomass Crop Assistance Program – Project Areas Numbers 2 through 5 Implemented in Arkansas, Missouri, Ohio and Pennsylvania County Locations for New Giant Miscanthus Biomass Producers. https://www.fsa.usda.gov/Internet/FSA_File/bcap_areas2_5_2011.pdf

²³ Biomass Crop Assistance Program – Project Area Number 10. https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/Energy/BCAP/bcap_proj10.pdf

²⁴ USDA: Feedstocks and the AJF Supply Chain the Broad Pictrue, Harry Baumes, Sep. 14, 2016. https://energy.gov/sites/prod/files/2016/09/f33/baumes_alternative_aviation_fuel_workshop.pdf

turning grass into food service packaging, and it is looking to expand this model to several more states.²⁵

In northern New York State, the BCAP project has led to the commercialization of shrub willow grown for as a source of renewable energy. Eight landowners are now taking part. All of the willow biomass grown will be used to produce renewable energy at facilities owned by ReEnergy Holdings LLC in northern New York. The purchase of willow to generate renewable energy will inject about \$3 million into the local economy over the course of the project.²⁶

Recommendations for the Next Farm Bill

BCAP has the potential to be a huge benefit to the development of the biobased economy and to agricultural producers looking for additional income streams. We would encourage the Committee to provide the program robust funding in the next Farm Bill. The key impediment to BCAP's success has been the continual reduction of mandatory funds by appropriators and delays by USDA in implementing the program.

We also would encourage the Committee to explore how BCAP can be better utilized to improve forest health through reductions of hazardous fuels. BIO supports expanding the eligibility of BCAP to include energy sorghums (sweet sorghum, biogas and biomass sorghums) and eligibility of energy sorghum for all of the payments once they are restructured. Introduction of a parallel payment structure for annual crops that remunerates for annual planting and annual retrieval is also necessary for annual crops like sorghum. Rather than dividing payments into establishment, maintenance and retrieval, a structure appropriate for forestry and perennial crops.

Conclusion

Farm Bill energy title programs have been incredibly successful in incentivizing the biobased economy. Because of the research, loans, and grants provided by these programs, industrial biotechnology companies are developing new feedstocks, industrial enzymes, and biological catalysts for the conversion of biomass for the production of advanced biofuels, alternative jet fuels, renewable chemicals, and biobased products.

The industry is on the cusp of creating a robust biobased economy through U.S. biobased production. This encompasses a value chain from agriculture through the manufacture of consumer goods that provides a cost-competitive alternative to petroleum's value chain and brings environmental, economic and other benefits. This generates new markets for agricultural producers, boosts innovation in domestic manufacturing and exports, and stimulates sustainable economic growth. In turn, because the inputs and technologies are domestically developed, this sector will boost the incomes of America's farmers, revitalize rural communities, create high-skilled jobs in the manufacturing sector, and provide sustainable employment.

BIO and the Ag Energy Coalition are ready to serve as a resource to the Committee in developing the energy title and look forward to working with you during reauthorization of the Farm Bill.

²⁵ Miscanthus: Cultivating a Brighter Future. <http://www.aloterrallc.com/>

²⁶ Extension BCAP Helps Commercialize Shrub Willow for Bioenergy in Northern New York Apr. 20, 2016. <http://articles.extension.org/pages/71099/bcap-helps-commercialize-shrub-willow-for-bioenergy-in-northern-new-york>

For purposes of my testimony, I attach hereto the following supporting documents as references for the Committee:

Appendices

Appendix A – BIO – Advancing the Biobased Economy: Renewable Chemical Biorefinery Commercialization Progress, and Market Opportunities, 2016 and Beyond

Appendix B – BIO – The Biobased Economy: Measuring Growth and Impacts

Appendix C – USDA – An Economic Impact Analysis of the U.S. Biobased Products Industry

Appendix D – Biomass R&D Board – The Billion Ton Bioeconomy Initiative: Challenges and Opportunities

Appendix E – Federal Activities Report on the Bioeconomy

Appendix F – Farm Bureau Coalition Letter on Farm Bill Budget